

COVID-19 vaccine breakthrough case investigation

Information for state and local health departments

Objective

Investigate SARS-CoV-2 infections among people who received COVID-19 vaccine to identify trends or clustering in demographics, the administered vaccine, or the infecting virus.

Case definition

A person who has SARS-CoV-2 RNA or antigen detected on a respiratory specimen collected ≥ 14 days after they completed the primary series of an FDA-authorized COVID-19 vaccine.

Exclusion criteria

The person had SARS-CoV-2 RNA or antigen detected on a respiratory specimen collected < 45 days before the most recent positive test.

Screening questions to assess if case meets vaccine breakthrough investigation criteria

1. Received full primary series of an FDA-authorized COVID-19 vaccine (e.g., two doses of the Pfizer or Moderna COVID-19 vaccines or one dose of the Janssen COVID-19 vaccine)?
 - a. **If YES, proceed to question #2**
 - b. Stop if:
 - i. No documented or reported COVID-19 vaccination
 - ii. Received incomplete primary series of COVID-19 vaccine (e.g., one dose of Pfizer or Moderna mRNA vaccine)
 - iii. Received a COVID-19 vaccine that is not FDA-authorized
2. Respiratory specimen tested positive for SARS-CoV-2 RNA or antigen and was collected ≥ 14 days after receiving the last dose of an FDA-authorized COVID-19 vaccine?
 - a. **If YES, proceed to question #3.**
 - b. Stop if:
 - i. No COVID-19 laboratory test result
 - ii. Only a negative or equivocal test result
 - iii. Only a positive result on another test type (e.g., antibody)
 - iv. Only a positive result on a non-respiratory specimen (e.g., serum)
 - v. Positive specimen was collected < 14 days after receiving the last dose of the COVID-19 vaccine
3. Known positive test for SARS-CoV-2 RNA or antigen on a respiratory specimen collected < 45 days prior to the most recent test?
 - a. **If NO or UNKNOWN, proceed with case investigation on the next page.**
 - b. Stop if:
 - i. Documented SARS-CoV-2 RNA or antigen detected on a respiratory specimen collected < 45 days before the most recent positive test.



Steps for initiating a COVID-19 vaccine breakthrough case investigation

1. Request the clinical or public health laboratory hold any residual respiratory specimens from the positive COVID-19 test.
2. Report the available case data to the National Notifiable Diseases Surveillance System (NNDSS), per normal procedures.
3. Record the case in the COVID-19 vaccine breakthrough REDCap database
 - a. Sequence results from a state public health laboratory, commercial reference laboratory, or academic laboratory should be reported by entering the PANGO lineage, and GenBank or GISAID accession number into the COVID-19 vaccine breakthrough REDCap database.
4. If viral sequencing is not already being performed and an acceptable specimen is available, provide instructions for the testing laboratory to send the residual respiratory specimen to the state public health laboratory for subsequent submission to CDC.
5. CDC will monitor NNDSS and the Vaccine Adverse Event Reporting System (VAERS) for additional cases and will upload available data reported to those systems into the COVID-19 vaccine breakthrough REDCap database for your review and confirmation.
6. Ultimately, CDC will use the National Notifiable Diseases Surveillance System (NNDSS) to identify vaccine breakthrough cases. Once CDC has confirmed that a state can report vaccination history data to NNDSS, CDC will identify vaccine breakthrough cases through that system. At that time, the state health department will stop reporting cases directly into the national COVID-19 vaccine breakthrough REDCap database. CDC will upload the available data reported to NNDSS into the COVID-19 vaccine breakthrough REDCap database for further review and confirmation by the state health department.
7. In the coming weeks, CDC will transition this surveillance activity to focus on identifying and investigating only those vaccine breakthrough infections that result in hospitalization or death. This shift will help maximize the quality of the data collected on cases of greatest clinical and public health importance.

Data access and management

CDC has created a COVID-19 vaccine breakthrough REDCap database that designated state health department investigators can use to enter, store, and manage data for cases in their area. The health department investigators have full access to data for cases reported from their jurisdiction.

Questions

Please contact the CDC vaccine breakthrough case investigations team at eocevent531@cdc.gov.